

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/19596

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : F16J 15/40, 15/447; F01D 11/00, 11/02

US CL : 277/409, 411-415; 415/171.1, 173.5, 174.5

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 277/409, 411-415; 415/171.1, 173.5, 174.5

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| X          | US 5,597,746 A (Hagi et al) 19 October 1999 (19.10.1999), figure 1.                | 1-8                   |
| A          | US 4,925,365 A (Crozet et al) 15 May 1990 (15.05.1990), entire document.           | 1-8                   |
| A          | US 4,820,119 A (Joyce) 11 April 1989 (11.04.1989), entire document.                | 1-8                   |
| A          | US 5,794,942 A (Vance et al) 18 August 1998 (18.08.1998), entire document.         | 1-8                   |
| A          | US 4,545,586 A (Von Pragenau) 08 October 1985 (08.10.1985), entire document.       | 1-8                   |
| A          | US 4,257,735 A (Bradley et al) 24 May 1981 (24.05.1981), entire document.          | 1-8                   |
| A          | US 6,039,535 A (Kobayashi et al) 21 March 2000 (21.03.2000), entire document.      | 1-8                   |



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

21 July 2005 (21.07.2005)

Date of mailing of the international search report

23 NOV 2005

Name and mailing address of the ISA/US

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